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Tax revenues in transition countries

Structural changes and their policy implications

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Abstract: Changes in the tax structure and category of taxes clearly matter when it comes to initiating tax policies. This paper employs data from a sample of 33 transitional countries over the period 1991–2014. It finds that, in a particular transitional country, the higher the national income, the degree of openness, the share of the non-agricultural sector, the rate of population growth, the extent of urbanization, the density of population, the proportion of younger population, and the employment rate, the higher the ratio of taxes to GDP. Moreover, GDP per capita growth can bring about changes in the tax structure of a country. The findings also indicate that determining the causes of change in the composition of tax revenue during the course of economic development as indicated by GDP per capita growth is helpful in creating a more effective tax revenue mix in transition economies.

Keywords: tax revenue, economic growth, transitional economies
JEL classification: H20, O40, P20

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1 Introduction

Economic theory postulates that different taxes or alternative tax policies have a diverse and contrasting impact on economic growth. The effect of taxes on economic growth has been studied extensively, often with the conclusion that an increased level of income taxes (both corporate and personal) can be detrimental to economic growth. However, the opposite effect—how economic growth can influence changes to the structure and composition of taxes—has not been comprehensively studied.

The structure or composition of tax revenues has diversity within broad patterns, and changes during the process of economic growth. Such diversity in tax structure tends to increase as economic growth (measured by GDP per capita) reaches higher levels. At high-income levels, greater diversity in tax structure can be seen in terms of the choice between direct and indirect taxes. At lower income levels, the composition of tax revenues may depend on the nature of the economic structure and tax administration.

Different levels of economic growth may have different impacts on the various components of total tax revenue. At a given level of taxation, a change in tax revenue composition may have different effects on factors such as output growth, administrative and compliance costs, equity, efficiency, and stability as a source of revenue, depending on the tax mix. Grasping the significance of changes in tax structure or shifts in the composition of tax revenue can help in the formulation of policies affecting the choice of an appropriate tax revenue mix. Even if a certain level of taxation seems appropriate as a whole for a given country, the structure or composition of tax revenues may not be suitable due to over- or under-utilization of some types of taxes, the latter often leading to inefficiencies in tax collection related to the cost of administration, particularly in transitional countries.

Empirical studies on changes in the composition of tax revenues are scarce. Even rarer is research on changes in tax structure and composition in transition countries[1], which have experienced prominent shifts in their tax structures over the last two decades. This paper utilizes more than a 25-year span of data on tax performance from the International Centre for Taxation and Development (ICTD)'s Government Revenue Dataset (GRD) and on the national income of transition countries since the fall of communism in order to assess the effect of economic growth on tax structure—an effect that has not been systematically addressed in the literature so far.

If we compare the ratio or level of government revenue between countries, it is obvious that this ratio increases with economic growth. But how and why do tax structures change at different levels of economic growth in transition countries?

This paper: (1) provides the theoretical justification for the hypothesis that economic growth as measured by GDP per capita affects the composition of tax revenues, the fiscal structure, and tax collection; and (2) analyses the determinants of tax shares in 33 transitional countries over the period 1991–2014 by means of a panel data analysis. The paper seeks an answer to the question: Which tax bases in transitional countries are affected by economic growth and to what extent? As

[1] The terms 'transition' and 'transitional' have been used interchangeably to refer to the former Soviet bloc countries (including countries in Central and Eastern Europe, the Baltic Sea states, and South Caucasus and Central Asian countries, but excluding China, Cuba, and North Korea, which have not been analysed in this research), which are seen as being in transition from centrally planned economies to market-driven systems.

a corollary, it will assess whether changes in the economy influence the evolution of the tax structure and what changes in the tax structure are associated with economic growth.

The 33 transition economies covered by this study are divided into four groups: (i) advanced transitional economies of Europe[2]; (ii) other Central and Eastern European economies in transition[3]; (iii) developing economies of Asia[4]; (iv) Commonwealth of Independent States (CIS) (see Appendix C).

Transitional countries with different income levels have different tax burdens. Figures A1 and A2 show that, between the fiscal year 1995 and the fiscal year 2012, income level rose much faster than overall tax collection in many of the targeted countries and that, in contrast to income per capita growth (whether in terms of level or the growth rate), the tax to GDP ratio between 1995 and 2012 does not have a regular pattern; in some countries tax to GDP ratio has greatly increased (but by a lesser margin than income per capita), while in others it has only slightly increased, and in a third group of countries it has decreased. For example, in Azerbaijan, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Macedonia, Latvia, Lithuania, Serbia, Slovak Republic, and Slovenia the tax to GDP ratio was lower in 2012 than in 1995. However, tax to GDP in Georgia increased from 8.3 per cent in 1995 to 21 per cent in 2012 and in Kazakhstan from 6.8 per cent in 1995 to 13.9 per cent in 2012.

The three most significant sub-categories of tax revenues—taxes on income, taxes on goods and services, and social security contributions—also varied over time as a percentage of GDP (Figure A3[5]). In general, it can be seen that there is an upward trend in taxes on goods and services over time in all four regions: advanced transitional economies of the EU (except for Slovakia and Macedonia), Central and Eastern Europe, developing Asia, and CIS. There is also an upward trend in the collection of taxes on income across CIS countries (with the exception of Azerbaijan and Kyrgyzstan) and in the advanced transitional economies of the Euro area (except for Slovakia).

This paper contributes to the empirical literature on taxation by integrating and extending several theoretical and empirical features of cross-country tax studies with a focus on transitional countries and individual tax types. It is the first comparative analysis of changes in tax structure in transitional countries where current data have been employed, eliminating the possible bias inherent in using only data relating the initial 5–7 years of transition, as has previously been the case. It is also the first attempt to relate recent changes in the tax structures of transitional countries to comparable changes in other developed or emerging economies. The model is estimated by using unbalanced panel data supplemented by annual observations from a relatively diverse sample of 33 transitional countries over the period 1991–2014.

The rest of this paper is organized as follows: Section 2 describes the tax structure changes in transitional countries during the last two decades. Section 3 outlines the theoretical considerations.

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[2] According to the UN classification, these transitional economies, which are all EU member states, are considered 'developed economies' (United Nations 2016).

[3] I included Hungary and Poland in this category in view of their geographic location in Central and Eastern Europe, despite their being members of both the EU and the OECD.

[4] According to the UN (2016) classification. I combined the 'Least Developed Countries of Asia' and the 'Developing Economies of Asia' in one cluster, as the sample of countries from this sub-region is not large (see Appendix C for details).

[5] Due to limitations of data, not all 33 countries are represented in Figure A3, which is descriptive in nature only, showing the major types of tax in different transitional countries grouped or clustered geographically.

Section 4 presents the empirical model, the empirical results, and their interpretations. Section 5 provides a summary and conclusion.

2 Tax structure changes for different levels of economic growth in transitional countries

Both transitional and developing countries have experienced prominent shifts in their tax structures in recent decades (Bahl and Bird, 2008: table 2[6]). In contrast to developed countries, income taxes—in particular personal income tax—have continued to play a limited role, and indirect taxes make up the bulk of tax revenues in transitional economies. Bahl and Bird (2008) separated transitional countries from developing countries in their study because, as they argue, trade taxes for transitional countries are of only minor importance. Yet their findings are not based on robust results, as their data for the 2000s are not complete and they do not include more recent data. They use only data up to 2003 to assess the whole decade of the 2000s.

Evidently, it is easier to collect taxes from economies that are high-income, urban, and non-agricultural and where the ratio of domestic and international trade to GDP is high. Governments in transitional countries raise between 15 and 40 per cent of GDP in revenue. Overall, tax ratio to GDP varies from an average of 13 per cent in low-income transitional countries to 35 per cent in high-income OECD member transitional countries (IMF 2011: 53–54[7]). Low-income countries rely more on taxing companies than individuals. According to the IMF's (2011) study, the ratio of corporate to personal income tax revenues is 0.3:1 in the high-income OECD countries and 1.4:1 in the low-income countries.

In an attempt to explain the variation in tax systems among Central Eastern European and former Soviet Union countries, Gehlbach (2008) demonstrates that after the collapse of communism the Central Eastern European countries shifted to a 'Western' style tax system with a broad tax base and gave a prominent role to taxes on personal income, while the former Soviet Union countries focused taxation on taxes on goods and services and on corporate taxation—especially of a few big, often monopolistic, industrial enterprises.

According to Gehlbach (2008), when the state budget relies heavily on tax revenue from a few key sectors, it may steer economic policy into a 'revenue trap'. Gehlbach (2007, 2008) argues that, since the collapse of the Soviet Union, policymakers have been caught in just such a revenue trap, as they have favoured policies that generate tax revenue from the formerly state-owned enterprises and industries, the effect of which has been detrimental to the emergence of an entrepreneurial sector. Two facts are interesting to note in this regard. First, the providers of the bulk of this revenue—the formerly state-owned enterprises themselves—still rely heavily on constant government support. Second, proper re-allocation of labour and capital in the newly emerged private economy or sector has not materialized. In being incapable of escaping from their reliance on revenue from state-owned enterprises, the governments of former Soviet Union countries have themselves become part of the problem rather than providing a solution. In contrast, the countries of Eastern Europe have focused their tax schemes on the economic activities of the emerging private sector, with policymakers supporting such a move. Gehlbach's (2008) data on the tax structures of transitional countries in the second half of the 1990s highlight the prominence of

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[6] Available at: https://www.ntanet.org/NTJ/61/2/ntj-v61n02p279-301-tax-policy-developing-countries.pdf?v=%CE%B1&r=6045547083536467 (accessed 15 December 2016).

[7] Available at: https://www.imf.org/external/np/pp/eng/2011/030811.pdf (accessed 16 December 2016).

taxes on income, social security, and payroll in almost all Central Eastern European countries and the importance of taxes on goods and services in the former Soviet Union countries (Table B1).

Gehlbach (2008) argues that six conditions could have created the revenue trap in countries of the former Soviet Union. These conditions are:

1) a deep structural crisis in the economy, giving the state the leeway to influence the economic structure in the short term
2) an industrial structure dominated by big and often monopolistic enterprises, which are easy to tax
3) the absence of orientation towards EU membership, which would demand a Western-style tax reform
4) a low level of economic development, implying an inefficient (i.e. incompetent, under-financed, or corrupt) state bureaucracy and tax administration
5) few restrictions on formal economic policy-making, such that the dominant state actor can push related tax regulation through the legislative process without opposition from other political forces or business interests
6) policy choices based on tax revenue as a first-order political concern and favouring easy revenues from enterprises with high taxability.

Reviewing Gehlbach's (2008) explanation of the variation in tax systems among the post-communist countries during their initial stages, Pleines (2009) identifies Gehlbach's unsystematic elaboration of the conditions causing or promoting the revenue trap, yet finds his six conditions quite reasonable.

As a result of these conditions, the first five years of transition (1991–1995) were characterized by economic disruption and turmoil and decreasing output, and the tax revenue to GDP ratio declined sharply in many countries of the former Soviet Union (Table B2).

Two other factors should be mentioned here: the decentralization of foreign trade and changes in the former Soviet pension system, which led to a rise in payroll tax rates in most countries of the former Soviet Union from 9 per cent in 1989 to 36 per cent by 1995. These caused a sharp decline in corporate and personal income tax receipts (Cheasty 1996). The outcomes of these losses by type of revenue are presented in Table B3.

3 Theoretical considerations

The main objective of this paper is to study changes in the tax structures of the selected post-communist transitional countries over time and examine the policy implications of those changes with respect to social and economic issues. The empirical analysis will also allow us to determe the main factors that can cause changes in the relative importance of different tax categories.

The main hypothesis of this paper is that economic growth, as measured by GDP per capita growth, affects the tax structure and thus tax policy of transitional economies (an alternative measure of economic growth is defined as the rate of change in GDP: Y_t/y_t- y_t– 1). This hypothesis is rooted in the fact that, as economic growth takes hold, governments seek alternative sources of revenue to finance their priority projects, leading to changes in the tax mix/structure. Empirical analysis of this hypothesis employs panel data regression.

The paper uses three concepts as the basis of the analysis. The first is the concept that tax structure changes during economic development (Hinrichs 1966; Abizadeh 1979; Abizadeh and Gray 1985; Abizadeh and Yousefi 1996; Tarschys 2003). The second is that tax systems vary among the Central Eastern Europe and the Former Soviet Union countries (Gehlbach 2008). The third is the 'extended' model of tax revenue (Sobel and Holcombe 1996)[8], which has been used to estimate the income elasticity and variability of tax revenue identified in several other studies (Tosun and Abizadeh 2005; Mahdavi 2008; Aydin 2010; Poghosyan 2011). In addition, this study focuses on transitional countries.

The standard model of tax revenue postulates the following pattern of changes in tax revenues:

$$ln\,(B_t) = \alpha + \beta \ln(Y_t) + \varepsilon \qquad (1)$$

where B_t denotes the level of the tax base at time *t*, Y_t represents the level of aggregate income during the period, and the coefficient β represents the income elasticity of revenue from this tax base and serves as a proxy for both the long-run growth and the short-run variability of the tax.

The 'extended' model of tax revenue proposed by Sobel and Holcombe (1996) compares the income elasticities of several taxes. The model separates the different taxes into those with long-run and those with short-run income elasticity and shows that there is greater variability in the short-run elasticity estimates. The authors highlight that the income elasticity of tax bases is a valuable tool for two reasons. First, it can be used as a proxy, as explained above, to measure periodic fluctuations of tax revenues in the short term. Second, it marks the tax revenue changes (rise or fall) in the long term. While the long-run income elasticity of a tax base indicates that revenue from that tax base will increase as income grows, short-run elasticity indicates that revenue from that base will fluctuate over the business cycle. Sobel and Holcombe (1996) provide an example of corporate taxable income and the retail sales tax base in the US, which have roughly the same income elasticity in the long run, while corporate income taxes have a much greater short-run elasticity than sales taxes. Hence, the two tax bases demonstrate approximately the same rate of revenue growth as that of income over the long run, yet corporate income taxes fluctuate much more in response to short-run fluctuations in income.

Sobel and Holcombe (1996) estimate the annual growth rate of tax bases (their change form), denoted by a delta (Δ) before the variable, which shows more tax structure changes over the business cycle than does GDP:

$$\Delta \ln(B_t) = \alpha + \beta \Delta \ln(Y_t) + \varepsilon \qquad (2)$$

Income growth and changes in associated socio-economic determinants can have various lasting impacts on the collection of taxes, making one group of taxes either less or more appealing to collect as it becomes less or more valuable and/or costly to administer. Thus, income growth can change different taxes in different ways.

To figure out the theoretical relationship between, on the one hand, the level of income growth and associated socio-economic and demographic variables (trade, share of agriculture to GDP, unemployment, inflation, population growth and density, urbanization, ageing) and, on the other,

[8] There is also a study by Girouard and Andre (1995), which offers a disaggregated approach to the cyclical adjustment of revenues in measuring the elasticity of individual tax categories with respect to their respective bases.

tax bases and tax structures, Tosun and Abizadeh (2005) assume a tax structure with only two taxes, tax *A* and tax *B*. Shares of these taxes in total tax revenues are defined as:

$$\tau^a = \frac{t^a A(Y)}{T} \tag{3}$$

$$\tau^b = \frac{t^b B(Y)}{T} \tag{4}$$

where:
τ^a = share of tax A in total tax revenue
τ^b = share of tax *B* in total tax revenue
A = base for tax *A*
t^a = average tax rate for tax *A*
B = base for tax *B*
t^b = average tax rate for tax *B*.

Both *A* and *B* are functions of the level of income *Y*. *T* is total tax revenue and is equal to:

$$T = t^a A(Y) + t^b B(Y) \tag{5}$$

As $\tau^a + \tau^b = 1$, shares of taxes *A* and *B* depend on the tax rates, tax bases, and income, as follows:

$$\tau = f[t^a, t^b, A(Y), B(Y)] \tag{6}$$

A change in the basic rate of tax and, particularly, a relative change in the tax bases results in tax structure variations and is therefore a powerful tool for policymakers to loosen or tighten fiscal policy and strategies. A change in tax base, including a broadening of the tax base (i.e. more people and enterprises paying tax), could raise more revenue to meet the cost of government or infrastructure spending. So, income growth leads to changes in the bases of different taxes and consequently to changes in the tax structure. To determine which tax base is affected by income growth and to what extent is pivotal in exploring the relationship between income or GDP per capita growth and tax structure.

4 The empirical model and data

In order to test the main hypothesis of this paper—that economic growth, as measured by GDP per capita, changes the tax structure and thus tax policy in transitional economies—the following regression equation is utilized:

$$\Delta ln\, TAX_{i(t,t-1)} = \alpha + \beta_{it}\, \Delta\, ln\, GDPPC_{i(t,t-1)} + Z_{it}\eta + f_i + \varphi_t + \varepsilon_{it} \tag{7}$$

where:
TAX_{it} = share in total tax revenues for each tax category shown in country *i* at time *t*
$GDPPC_{it}$ = GDP per capita growth
β_{it} = coefficient indicating the response of the tax share to economic growth
f_i = unobservable country-specific, time-invariant effects
φ_t = unobservable time-specific effects
Z_{it} = matrix that includes all remaining control variables, where η is a vector of coefficients.

To explore in more detail the relationship between the level of economic growth (GDP per capita) and tax bases/structures, the following socioeconomic indicators and demographic variables are used in the regression analysis:

$$Z_{it} = (POP_{it}, XM_{it}, NAGR_{it}, INF_{it}, GRCF_{it}, UNEM_{it}, TRSM_{it}, URB_{it}, POPDEN_{it}) \quad (8)$$

$$\Delta ln\, Z_{it} = \Delta ln\, (POP_{it}, XM_{it}, NAGR_{it}, INF_{it}, GRCF_{it}, UNEM_{it}, TRSM_{it}, URB_{it}, POPDEN_{it}, AGE_{it}) \quad (9)$$

where a delta (Δ) before the variable denotes testing whether the variables are stationary in their change form.

POP_{it} denotes the rate of population growth. Population growth and GDP per capita growth have been used as proxies for the level of development of each transitional country. The prior expectation is that higher per capita income is associated positively with tax collection. A faster rate of population growth is also positively associated with tax collection and leads to a higher share of many types of tax. Countries with more rapid population growth may be able to collect more taxes from new segments or generations of taxpayers. Thus, one can expect that the rate of population growth would be positively related to tax collection.

The same expectations hold with other demographics variables. URB_{it} refers to the population living in urban areas (per cent of total). A higher proportion of urban population can lead to the higher revenues from taxes in general. $POPDEN_{it}$ denotes population density (people per square km of land area). It is expected that densely populated urban areas increase tax collection overall and contribute to a higher share of certain types of tax in particular.

Trade taxes are often a major source of revenue in lower-middle-income transitional countries, as they are easier and less costly to collect than taxes on income. Trade is measured by degree of openness. The openness variable in the model, XM_{it}, quantifies the ratio of the export/import of goods and services to gross domestic product.

$NAGR_{it}$ is the non-agriculture share of GDP. It is expected that the bulk of public sector activities are based in urban areas (Tanzi 1992) and that revenue from the agricultural sector is in most cases infinitesimal. The lack of bookkeeping makes the agricultural sector hard to tax (Mahdavi 2008), which is why a higher share of the agricultural sector in transitional economies is correlated with lower tax revenue, i.e. they are associated negatively.

Three aspects of macroeconomic context—inflation, capital gross formation, and unemployment—can be associated closely with changes in the composition of taxes. INF_{it} is inflation (annual per cent) as measured by the annual growth rate of the GDP implicit deflator, showing the rate of price change in the economy as a whole. High inflation rates could lead to higher collection of some kinds of tax, while at the same time adversely influencing revenue from other types of tax.

The gross capital formation variable (in constant US$), $GRCF_{it}$, has been used to control the effect of the specific tax base expansion from capital taxation. The unemployment rate, $UNEM_{it}$, can control for direct tax base changes in taxes on income, profit, and capital gains, and is measured by the total number of unemployed in the total labour force. I expect that higher unemployment rates contract the base of taxes in general and taxes on incomes, profits, and capital gains in particular.

Different kinds of tax and overall tax revenues are affected by other demographic factors. The old-age dependency ratio variable, AGE_{it}, is used to control for relatively heavy reliance on certain

taxes (e.g. social security contributions and property taxes) due to a higher proportion of elderly people in the population. It is expected that when people retire, they work less, may have enough savings to purchase property and as a result boost property tax collection, but reduce their share of personal income taxes.

$TRSM_{it}$ denotes international tourism receipts as a percentage of total exports to control for the tax-exporting behaviour of transitional countries. One can expect that attracting tourists will boost a country's collection of indirect taxes (Tosun and Abizadeh 2005).

Finally, *lagged years after 1997* is used as a kind of 'real transition period' dummy to capture the impact of widespread tax and socioeconomic policy changes after the tumultuous initial period of transition. This dummy variable is supposed to account for catching-up effects in order to minimize the effect of the 'revenue trap' (Gehlbach 2008) during the initial six years of transition from a planned economy to a market economy.

There are several classifications of total tax revenue that can be used to analyse the tax structure data. This paper employs two major tax classification schemes compiled by the ICDT for its Government Revenue Dataset (GRD), which contains the most comprehensive and up-to-date data on revenue performance in disaggregated form across counties and over time (Prichard et al. 2014):

1) Basic revenue classification scheme for ICTD GRD, which includes data on: (a) taxes on incomes, profits, and capital gains; (b) taxes on property; (c) taxes on goods and services; (d) taxes on international trade and transactions; (e) other taxes.
2) Expanded revenue classification scheme for ICTD GRD, which contains data on: (a) resource direct taxes; (b) resource indirect taxes; (c) non-resource direct taxes; and (d) non-resource indirect taxes.

Based on the GRD, the model employs several dependent variables associated with the structure and composition of tax revenue: social security contributions and each tax category from the basic and expanded ICTD GRD revenue classification schemes mentioned above.

The inconsistency and incompleteness of data from other (non-GRD) sources on the structure of general government taxes in transitional countries for 1991–1997 can lead a researcher to omit this period of investigation despite its great historical importance in explaining changes in tax structure caused by growth, be it positive or negative. This is where the GRD dataset is particularly valuable: more complete and accurate, it contains general and central government revenue data, and both combined and merged revenue data.

To analyse the impact of income growth on changes in tax structure, an unbalanced panel dataset consisting of annual observations from a relatively diverse (in terms of level of income and development, public administration, size, geographic location, type of democracy) sample of 33 transitional countries over the period 1991–2014 has been employed. The sample of countries was selected on the basis of (a) its common heritage of communism and a command-planned economy and (b) the existence of data on all variables for a minimum of five years. Although observations are not available for the entire sample period of 1991–2014, this type of unbalanced panel dataset is common in such empirical economic analyses (e.g. Baltagi 2005). Table D1 presents a list of all the variables used in the analysis and sources of data.

To estimate equation 7, the following approach is taken. First, the model is estimated by using a fixed effects procedure. The fixed effects model (FEM) is very valuable to control for country-constant unobserved features. Then, to avoid an endogeneity issue with the explanatory variables

GDP per capita growth and population growth, the model employs a generalized method of moments (GMM) and an Arellano–Bond dynamic panel data estimation. The Arellano–Bond estimation is very valuable to fit our panel data where some regressors (GDP per capita growth and population growth) could be endogenous. Accordingly, the fixed effects model and the transformed model are estimated. All specifications include time fixed effects. To rectify for possible simultaneity bias resulting from the variables, an instrumental variables technique is employed.

5 Empirical results

Table 1 summarizes the estimation results of equation (7) using the FEM. The following features of our empirical approach are notable. Columns 1 and 2 of Table 1 present the coefficient estimates for total tax revenue, including and excluding social security contributions (SSC). All estimated parameters conform to our prior expectations. The results in columns 1 and 2 show that the estimated coefficients for the main explanatory variable of interest—change in GDP per capita growth—are positive and statistically significant for total tax revenue, both including and excluding SSC, as hypothesized. This suggests that a faster overall rate of growth in GDP per capita is significantly associated with a higher share of tax revenues (including or excluding SSC) in general.

Almost all the remaining estimated parameters conform to our expectations. *Population growth* has a positive and statistically significant impact on total tax revenue, whether SSC is included or not. More rapid population growth is associated with greater total tax revenue, as expected. This may imply that an increase in the rate of population growth on average leads to higher tax revenue overall. Moreover, the results of the model indicate that trade as measured by *openness* is positively correlated with the share of tax revenues. A higher degree of openness or trade on average leads to an increase in share of tax revenues. The share of agriculture has a negative sign (not statistically significant), as hypothesized. This suggests that the higher the share of the agricultural sector in the structure of the economy, the lower the ratio of tax revenue to GDP, including or excluding SSC.

Among the macroeconomic context variables, the coefficient of *inflation* is positively and strongly correlated with tax revenue in general, including or excluding SSC, as expected. The positive effect of the inflation rate on tax revenue suggests that higher rates of inflation mean more tax collected, which, however, is worth less on account of the declined value of money. The *rate of unemployment* is statistically significant and negatively associated with tax revenue in general. It is consistent with our expectation that a higher rate of unemployment contracts the base of taxes in general. Furthermore, a higher rate of unemployment is connected with a decline in the collection of taxes in general, according to our estimation results. The *gross capital formation* variable positively and strongly influences the ratio of total tax revenue to GDP, including SSC. This suggests, counterintuitively, that capital taxation can facilitate tax base expansion.

Among the demographic variables, one can observe that *urbanization* and *population density* variables positively and strongly affect tax revenue in general. This confirms the expectation that urbanized areas, where the majority of industries are located and which are densely populated areas where more taxpayers live, facilitate tax revenue collection overall and contribute to a higher share of revenue. The variable *age 65 and above* in our estimation results suggests that, with population aging, on average the relative reliance of governments on tax revenue in general is expected to diminish. An increase in the over 65 part of the population appears to be strongly linked to lower tax revenue in general and to a contraction of the base of tax revenue. The estimated coefficient *tourism* has a

positive sign, but is not statistically significant in our model. It suggests that an increase in the number of tourists is associated in general with expansion of the overall tax revenue base.

The estimation results suggest that the variable *lagged years after 1997* has a positive sign in capturing the impact of tax revenue after the initial years of transition and in minimizing the 'revenue trap' effect of the first six years of transition. However, the variable is not statistically significant, probably implying that this effect has not been stronger as the number of years since the fall of the Soviet Union (in 1991) has increased.

Table 2 reports the estimated parameters of equation (7) employing the GMM model regression results and utilizing the 'extended' model of tax revenue to estimate the tax structures in their change or difference form. Arellano–Bond Dynamic Panel Data regression has been run to address the endogeneity of some regressors in this model and to see if the estimates are different in practice. Some scholars contend that potential sources of endogeneity are business cycle effects and Wagner's Law[9] (Abizade and Gray 1985; Easterly and Rebelo 1993; Hsieh and Lai 1994; Acosta-Ormaechea and Yoo 2012). Kneller et al. (1999) are less concerned with Wagner's law, as this law implies association between GDP growth and the growth rate of spending and taxation, rather than with levels of expenditure and taxation. They follow Folster and Henrekson (1999) in dealing with the endogeneity problem and utilize country intercepts, the lagged levels of all fiscal variables, level and first difference of labour force growth, and initial GDP as instruments. Acosta-Ormaechea and Yoo (2012) take first difference, i.e. using growth rates as a control for the country-specific income-level factor that influences tax revenue. The variable of interest—income per capita growth rate—is stationary in its change form. Furthermore, in models utilizing growth rate of GDP per capita as a variable, like ours, endogeneity does not seem to be such a matter for concern (Kneller et al. 1999; Acosta-Ormaechea and Yoo 2012).

Nevertheless, to address endogeneity in this model as a preventive measure, two precautionary steps have been taken. First, the approach of Acosta-Ormaechea and Yoo (2012) to examine the relevance of endogeneity in a country-by-country basis was followed. Like them, after the robustness check, I excluded those countries that seem to be causing the endogeneity problem from the sample. Second, the GMM regressions were run with the lagged independent variable to account for time persistence in the dynamics of tax revenue estimates. Under the assumption of independent and homoscedastic residuals, the one-step GMM estimation generates more consistent parameter estimates. In this one-step GMM model, the first differences lagged dependent variable *TR* is instrumented with its past level and the strictly exogenous variables are instrumented with themselves. Thus, the lagged value for $\Delta ln\, TR_{i(t,t-1)}$ is used as an instrument to avoid a reverse causality of regressors that are not strictly exogenous. The independent variable with a one-year lagged value of tax revenues $\Delta ln\, TR_{i(t,t-1)}$ was created and tested. This lagged independent variable is not correlated with the lagged error term $\Delta ln\, \varepsilon_{it}$.

As can be seen in Table 2, the main results continue to be similar to those with FEM estimation. In columns 1 and 2, the coefficient of GDP per capita growth is positive and significant in relation to tax revenue. It suggests, again, the existence of a positive association between increase in income per capita growth and expansion of the total tax revenue base. These results suggest that faster growth is associated with an increase in total tax revenues.

[9] The main principle of this law stipulates that government spending and taxes are higher at higher levels of per capita GDP.

The results remain robust with the rest of the explanatory variables in columns 1 and 2 after the exclusion from the sample of several countries that seem to be creating an endogeneity issue. The coefficients of population growth, openness, inflation, urbanization, and population density are both positive and significant. This suggests, again, that these variables positively influence tax revenue and expand the base of most taxes. The coefficients share of agriculture, unemployment, and age are both negative and significant. This may imply that the last three variables affect tax revenue negatively and on average contribute to the contraction of the tax bases. The coefficients tourism and capital gross formation remain insignificant, but positive.

The Arellano–Bond test for zero autocorrelation in first-differenced errors suggests that there is no autocorrelation of either the first order (AR1) or the second order (AR2). In addition, the instruments of this model are valid, as corroborated by the Sargan test of over-identifying restrictions.

Table 1: Estimation results: impact of income growth on composition of tax revenues—Fixed-Effects Model

Dependent var.	Tax revenue		Basic revenue classification, ICTD GRD					Expanded revenue classification, ICTD GRD					
	(I) Δ ln TR		(II) Δ ln direct taxes		(III) Δ ln indirect taxes			(IV) Δ ln RDT			(V) Δ ln NRDT		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Development													
GDP per capita	3.31***	4.83***	8.25***	4.36	.633	4.41**	-8.68	.176	7.93**	.587***	.543*	.264	.587***
growth	(2.62)	(3.79)	(2.57)	(0.74)	(0.16)	(2.20)	(-0.82)	(0.65)	(2.53)	(3.52)	(1.64)	(0.74)	(3.52)
Population growth	2.52**	2.02*	2.11	5.28	5.91*	4.71**	-1.76*	.231	2.28	-.579	.574	.128	-.579
	(2.33)	(1.77)	(0.72)	(1.38)	(1.70)	(2.42)	(-1.73)	(0.94)	(0.81)	(-0.51)	(0.24)	(0.56)	(-0.51)
Openness													
Exp+Imp/GDP	2.73	2.95	1.65	2.84	5.73***	1.60**	-1.38**	.351***	8.56	-.637	.538***	.401***	-.637
	(0.55)	(0.59)	(1.14)	(1.25)	(3.56)	(2.06)	(-2.21)	(2.77)	(0.66)	(-0.39)	(4.31)	(4.58)	(-0.39)
Econ. structure													
Agriculture/GDP	-2.11	-6.57	-1.85	1.37	6.41**	1.29*	-2.53	-.253**	-1.15	-.892	.654*	.562	.892
	(-0.45)	(-1.39)	(-1.50)	(0.49)	(2.45)	(1.82)	(-0.52)	(-2.46)	(-0.99)	(-1.38)	(1.75)	(1.57)	(1.38)
Macroec. context													
Inflation	2.22**	2.96***	7.69***	-5.38	-1.13	3.74**	7.01	.131	7.04***	-.746	-.335	-2.19	-.746
	(2.15)	(2.77)	(2.68)	(-1.05)	(-0.35)	(2.24)	(0.79)	(1.38)	(2.64)	(-0.56)	(-1.48)	(-0.74)	(-0.56)
Gross capital	6.70*	4.42	-1.79	5.89**	-1.34	9.37	7.91**	-.002*	-1.33	-.005	.-007	-.043	-.005
formation	(1.67)	(1.06)	(-1.57)	(2.34)	(-1.00)	(1.48)	(2.24)	(-1.67)	(-1.23)	(-0.42)	(-0.83)	(-1.13)	(-0.42)
Unemployment	-6.32*	-5.99*	-1.95**	3.43	-1.47	-4.88	5.71**	-.189**	-2.27***	-.114**	-.211***	-.362***	-.114**
	(-1.84)	(-1.70)	(-2.10)	(1.39)	(-0.14)	(-0.92)	(2.08)	(-2.24)	(--2.61)	(-2.38)	(-2.61)	(-4.07)	(-2.38)
Recr./Demogr.													
Tourism	2.77	3.48*	-9.87*	-2.29**	.423	1.78	2.31	-.634	-.944	.513*	.561	-.623	.513*
	(1.33)	(1.86)	(-1.88)	(-2.30)	(0.07)	(0.53)	(1.34)	(-1.50)	(-1.86)	(1.72)	(0.31)	(-0.97)	(1.72)
Urbanization	8.37***	6.82***	-3.52	5.28**	-1.83	2.94	-2.53	1.61	1.57	.714***	-1.31**	-1.03**	.714***
	(4.77)	(3.79)	(-0.71)	(1.96)	(-0.31)	(1.04)	(-0.52)	(0.37)	(0.03)	(2.80)	(-2.33)	(-2.16)	(2.80)
Pop density	10.44***	1.31***	5.36***	2.14	6.96***	-5.61	-1.43	4.01***	4.20***	1.04**	4.108***	3.92***	1.04**
	(3.56)	(4.30)	(6.28)	(1.30)	(7.00)	(-0.01)	(-1.03)	(5.28)	(5.20)	(2.42)	(4.65)	(4.55)	(2.42)
Age 65 and above	-2.74**	-2.84**	-1.44***	8.31	7.00	-5.82***	4.00**	-.766**	-1.13***	-.244***	-1.04***	-1.79***	-.244***
	(-2.08)	(-2.06)	(-3.64)	(1.03)	(1.57)	(-2.70)	(2.55)	(-2.18)	(-3.14)	(-1.22)	(-3.07)	(-4.84)	(-1.22)
Years after 1997	.131	.218	628	3.06***	-.035	2.51***	-1.72	-.317*	.374	-.003*	-1.02***	-.527***	.096
	(1.08)	(1.54)	(1.55)	(5.35)	(-0.26)	(2.71)	(-1.26)	(-1.64)	(1.07)	(-1.90)	(-2.71)	(-2.89)	(0.45)
F-test	26.99***	31.55***	15.43***	3.06*	17.02**	7.82***	2.92*	14.1***	13.3***	10.8***	12.6***	11.5***	10.8***
Prob > F	0.000	0.000	0.000	0.000	* 0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	171	169	149	88	157	146	99	154	157	138	137	140	157
Adj. R-squared	0.680	0.715	0.588	0.372	0.607	0.462	0.330	0.558	0.539	0.520	0.596	0.575	0.523

Notes: *, **, *** indicate significance at 1%, 5%, and 10%, respectively. Absolute value of *t*-statistics is shown in parentheses. TR denotes tax revenue, RDT = resource direct taxes, NRDT = non-resource direct taxes.

Source: Author's elaborations.

Table 2: Estimation results: impact of income growth on composition of tax revenues—GMM

Dependent var.	Tax revenue		Basic revenue classification, ICTD GRD					Expanded revenue classification, ICTD GRD					
	(I) Δ ln TR		(II) Δ ln direct taxes		(III) Δ ln indirect taxes			(IV) Δ ln RDT			(V) Δ ln NRDT		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Development													
GDP per capita	2.52**	3.42***	.332**	.071	3.05**	1.31*	.188**	.594**	3.10**	.501**	.594	1.78	2.61**
growth	(2.03)	(2.81)	(1.99)	(1.60)	(1.97)	(1.84)	(2.13)	(2.24)	(2.15)	(2.29)	(0.24)	(1.00)	(1.97)
Population growth	.133*	.791*	.182	.019	4.38**	2.11*	.069	.652	.570	-.002	-.179*	-1.86	2.25**
	(1.65)	(1.78)	(0.76)	(1.28)	(2.26)	(1.64)	(1.01)	(0.24)	(0.26)	(-0.01)	(-1.70)	(-1.45)	(2.51)
Openness													
Exp+Imp/GDP	.957*	1.33**	.681	.205**	2.23*	1.03	.571	-.533	1.24	.007	-.159	-1.06	-1.67**
	(1.73)	(2.21)	(0.47)	(2.03)	(1.91)	(1.58)	(1.14)	(-0.50)	(0.93)	(0.40)	(-0.23)	(-1.27)	(-2.11)
Econ. structure													
Agriculture/GDP	-.804*	-1.30***	-4.91***	-.261*	8.87	2.32	-.384	-1.31	-2.81**	-.001	-.413	-.533	.546
	(-1.77)	(-2.67)	(-4.11)	(-1.80)	(0.89)	(0.44)	(-0.89)	(-1.47)	(-2.45)	(-0.08)	(-0.56)	(-0.59)	(0.97)
Macroec. context													
Inflation	.189**	2.25**	1.47	-.237	-.352	1.32**	.029	1.45	.235	-.001	.518	.712	-.947
	(2.27)	(2.40)	(0.65)	(-1.48)	(-0.19)	(2.14)	(0.46)	(0.89)	(1.09)	(-0.63)	(0.47)	(0.52)	(-0.73)
Gross capital	.979	.921	3.61	.037	5.62	1.38	.773**	-.368	-.398	.017	-.806	-.478	7.14*
formation	(0.29)	(0.25)	(0.37)	(0.24)	(0.71)	(0.32)	(2.33)	(-0.51)	(-0.45)	(0.99)	(-1.21)	(-0.62)	(1.76)
Unemployment	-.672**	-5.63*	-.755	.214	-4.15	-7.02**	-.129	-1.05*	-.776	.002	-1.37***	-1.53***	-1.20
	(-2.27)	(-1.80)	(-0.68)	(1.03)	(-0.67)	(-2.11)	(-0.43)	(-1.85)	(--1.10)	(0.25)	(-3.48)	(-3.41)	(-1.57)
Recr./Demogr.													
Tourism	.832	1.11	2.56	.032	.469	1.71	.003	2.15	6.41	-.003	-.429	.101	2.36
	(.037)	(0.46)	(0.47)	(0.54)	(1.01)	(0.62)	(0.23)	(0.49)	(1.22)	(-0.43)	(-0.11)	(0.24)	(1.55)
Urbanization	.669**	1.92*	-7.95	.261	6.43	1.18	-6.35**	3.05	4.34	-.008	-1.11***	-1.32***	1.14
	(2.33)	(1.84)	(-0.16)	(0.42)	(1.40)	(0.48)	(-2.13)	(0.78)	(0.81)	(-0.74)	(-3.77)	(-3.97)	(1.12)
Pop density	1.14***	1.31***	1.98**	-.052	1.67**	-3.48	1.03**	1.51**	3.19	.037	1.99***	2.20***	4.44
	(3.52)	(3.75)	(2.24)	(-0.06)	(2.42)	(-0.95)	(2.15)	(2.44)	(0.64)	(0.31)	(4.23)	(4.03)	(1.09)
Age 65 and above	-.337**	-1.96*	-6.00	1.13**	1.18**	-6.21**	-9.35***	2.69	1.60**	-.014	2.06	6.33	1.19
	(-2.18)	(-1.92)	(-1.07)	(1.98)	(2.50)	(-2.53)	(-3.00)	(0.66)	(2.08)	(-0.21)	(0.75)	(1.57)	(0.30)
Lag1: TR_{t-1}	.786	.927	.038	.617	1.39	-1.07	1.51	-4.84	.599	-2.59	-4.41	.599	4.34**
	(1.09)	(1.22)	(0.01)	(0.37)	(1.37)	(-.051)	(1.12)	(-0.69)	(0.75)	(-1.57)	(-0.88)	(0.75)	(1.98)
Wald chi2	204.93***	195.22***	191.70***	44.9***	68.2***	53.2***	31.9***	201.57	183.90	63.1***	227***	143***	68.2***
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sargan stat., chi2	133.38	136.62	110.12	33.18	91.16	78.81	40.39	111.87	123.3	53.69	100.69	110.47	102.97
Prob > chi2	0.03	0.02	0.03	0.17	0.67	0.33	0.54	0.01	0.02	0.00	0.00	0.02	0.06
Observations	122	117	96	46	106	92	81	104	106	91	89	91	106
AR(1), p-value	0.00	0.02	0.09	0.04	0.00	0.00	0.01	0.04	0.05	0.00	0.01	0.06	0.03
AR(2), p-value	0.32	0.42	0.18	0.90	0.81	0.06	0.83	0.15	0.19	0.71	0.10	0.15	0.27

Notes: *, **, *** indicate significance at 1%, 5%, and 10% respectively. Absolute value of *z*-statistics shown in parentheses. TR denotes tax revenue, RDT = resource direct taxes, NRDT = non-resource direct taxes.

Source: Author's elaborations.

6 Summary and conclusion

In this paper, I have used data for 33 transitional countries for the 1991–2014 period to investigate the relationship between per capita income growth and tax revenue. The fundamental conclusion of this paper is that per capita income growth leads to changes in the composition of taxes and the tax structure in transitional countries. These changes are mostly due to changes in the shares of different categories of tax in total tax revenue or the tax mix.

The empirical results of this paper are in line with economic theory and previous studies. The results confirm the general assertion that there exists a positive and significant relationship between income per capita growth and tax revenue. The results of our empirical analysis indicate that per capita income growth as measured by GDP per capita growth has a statistically significant positive effect on tax revenue in general. In particular, the results confirm that GDP per capita growth also has a strong positive influence on the disaggregated variables: share of taxes on incomes, profits and capital gains, and taxes on international trade, plus resource direct taxes, including or excluding SSC, and the share of non-resource indirect taxes. Thus, in the proposed model, a higher growth rate of GDP per capita is significantly associated with a higher share of tax revenues in general, as well as with taxes on income and on international trade, resource direct taxes, resource indirect taxes, and non-resource indirect taxes. The results of the model suggest that the change in the relative importance of different taxes over time, along with economic growth, opens avenues for governments to introduce new tax initiatives, leading to changes in the tax mix and tax structure.

However, I find that there are substantial differences in the impact of income per capita growth on different categories of tax. I have not found statistical significance in all tax categories. For instance, I have not found significant response to income growth by property taxes and non-resource direct taxes. GDP per capita growth seems to affect negatively the composition of 'other' taxes and non-resource direct taxes, including SSC. I further observe that there are few differences in the relation between the results for the initial six years of transition and the rest of the years. This suggests that the composition of taxes changes dynamically because of variations in income per capita growth.

When foreign aid becomes volatile and less predictable than domestic tax revenue by a wide margin, tax revenue collected—especially by lower-middle-income transitional countries—can spur government spending on its priorities, including social programmes, education, health care, public investment programmes, infrastructure, and general development.

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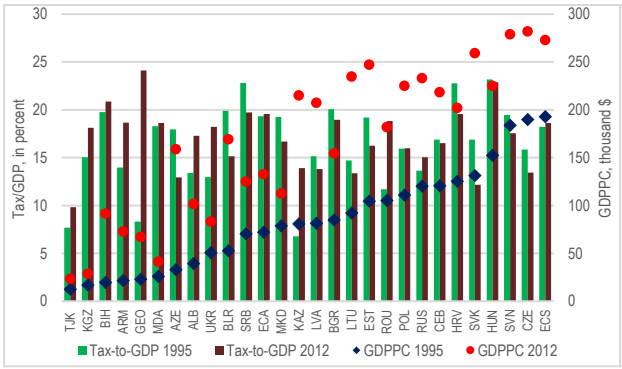
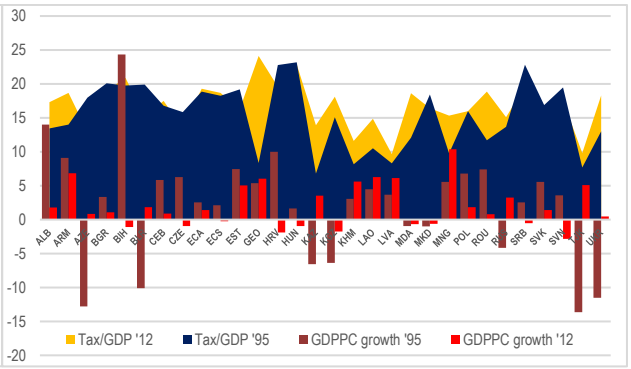
Appendix A: Figures

Figure A1: Tax revenue and income levels (GDP per capita, $'000) in countries with their economies in transition



Source: World Bank Group (2014).

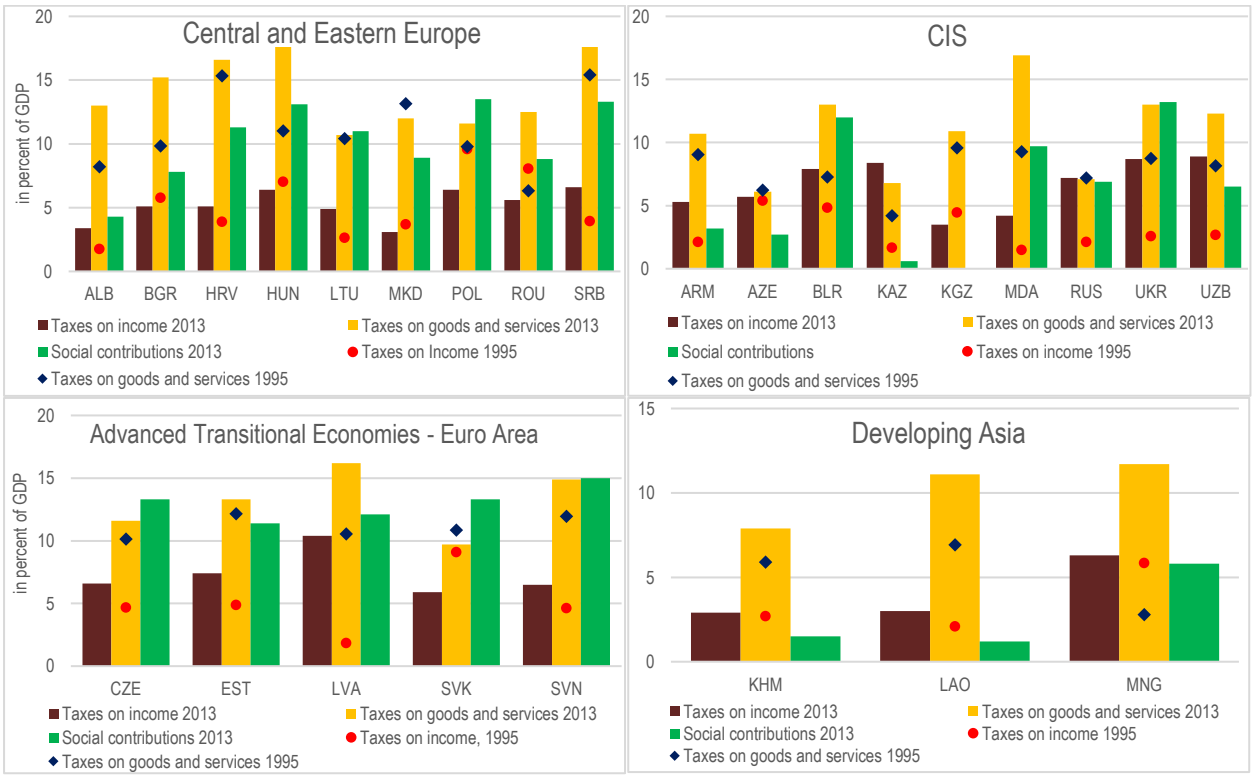
Figure A2: Tax revenue and income growth (GDP per capita growth) in countries with their economies in transition



Source: World Bank Group (2014).

Note: The figure shows a comparison of the tax to GDP ratio with income *levels* of transitional economies between 1995 FY and 2012 FY or latest available data (left panel) along with a comparison of the tax to GDP ratio with income *growth* between 1995 FY and 2012 FY or latest available data (right panel).

Figure A3: Major revenue categories in transitional countries, 1995 and 2013 (% of GDP)



Source: IMF (2015).

Appendix B: Tables

Table B1: Mean tax structure, 1994–2000

	Corporate taxes	Taxes on goods and services	Income taxes, social security, and payroll taxes	Other taxes
EE and Baltics				
Albania	0.08	0.41	0.25	0.25
Bulgaria	0.13	0.35	0.43	0.09
Croatia	0.03	0.45	0.42	0.10
Czech Republic	0.11	0.30	0.53	0.06
Estonia	0.06	0.35	0.55	0.04
Hungary	0.06	0.37	0.48	0.10
Latvia	0.07	0.35	0.51	0.07
Lithuania	0.06	0.37	0.51	0.07
Macedonia	0.03	0.34	0.51	0.12
Poland	0.08	0.33	0.49	0.11
Romania	0.12	0.28	0.49	0.07
Slovakia	0.12	0.31	0.49	0.07
Slovenia	0.03	0.35	0.53	0.10
CIS				
Armenia	0.20	0.40	0.24	0.15
Azerbaijan	0.22	0.31	0.31	0.16
Belarus	0.22	0.43	0.26	0.09
Georgia	0.12	0.42	0.29	0.18
Kyrgyzstan	0.09	0.47	0.35	0.09
Moldova	0.12	0.42	0.36	0.10
Russia	0.18	0.30	0.37	0.15
Tajikistan	0.13	0.48	0.20	0.19
Turkmenistan	0.21	0.46	0.29	0.05
Ukraine	0.20	0.31	0.39	0.10
Uzbekistan	0.23	0.52	0.13	0.12

Source: Gehlbach (2008: 52).

Table B2: Revenue decline in the countries of the Former Soviet Union, 1991–1995 (% of GDP)

	1991	1992	1993	1994	1995	Difference 1991–95
Uzbekistan*	31	32	42	36	35	4
Ukraine	38	44	44	46	41	3
Georgia	34	15	2	4	5	-29
Turkmenistan	38	42	19	10	9	-29
Tajikistan	33	36	36	54	14	-19
Azerbaijan	36	48	41	26	19	-17
Armenia	26	27	24	16	14	-13
Moldova*	32	20	17	17	20	-12
Russia	46	46	41	37	36	-10
Kyrgyz Republic*	22	16	15	19	15	-7
Kazakhstan*	21	23	22	17	16	-5
Lithuania	41	34	28	25	24	-18
Latvia	37	28	36	36	36	-1
Estonia	41	33	40	41	41	0
Belarus	48	46	52	48	44	-4
Average	**35**	**33**	**31**	**29**	**25**	**-10**

Note: * Does not include all payroll taxes.

Source: Cheasty A. (1996: 32–35).

Table B3: Revenue decline in the countries of the former Soviet Union (% of GDP and % of total)

	Soviet Union 1989	Unweighted average 1994[1]	Decline 1989–1994[2]
		(% of GDP)	
Total	**41.0**	**28.7**	**-12.3**
Taxes on wages	8.0	8.2	0.2
Personal income tax	4.4	2.6	-1.8
Social insurance	3.5	5.6	2.0
Taxes on enterprises[3]	12.3	7.1	-5.2
Taxes on consumption	12.0	9.0	-2.9
Foreign activity	6.3	1.7	-4.6
Non-tax revenue	2.5	2.7	0.2
		(% of total)	
Taxes on wages	19.0	28.0	-1.7
Personal income tax	11.0	9.0	14.9
Social insurance	9.0	19.0	-16.6
Taxes on enterprises[3]	30.0	25.0	42.2
Taxes on consumption	29.0	31.0	23.7
Foreign activity	15.0	6.0	37.5
Non-tax revenue	6.0	9.0	-1.7

Notes:

1. Countries of the former Soviet Union.

2. The calculation of decline is included for illustrative purposes only; the USSR figures and the average figures for the former Soviet Union are not strictly comparable because the 1994 average is unweighted.

3. Miscellaneous ‘other taxes’ have been added to taxes on enterprises. In all countries where they could be identified, they were property taxes on natural resources.

Source: Cheasty A. (1996: 32–35).

Appendix C: Classification[10] of countries with their economies in transition

Advanced transitional economies of Europe (11)

New EU member states – Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia

Other Central and Eastern European economies in transition (6)

Albania, Bosnia and Herzegovina, Kosovo, Montenegro, Serbia, the Former Yugoslav Republic of Macedonia

Developing economies of Asia (4)

East Asia (2) – Vietnam, Mongolia
Least developed countries of East Asia (as of November 2015) (2) – Cambodia, Lao People's Democratic Republic

Commonwealth of Independent States and Georgia[11] (12)

Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

[10] For more on the classification of countries, see United Nations (2016).

[11] Despite Georgia officially having left the CIS in August 2009, because of its geographic proximity and similarities in economic structure with other CIS countries, its performance data is analysed alongside that of other CIS member countries in this classification.

Appendix D: Data definition and data sources

Table D1: Description of variables: impact of income growth (GDP per capita) on tax structure in transitional countries

Variables	Unit of measure	Source
Taxes including social contributions	Percentage of GDP	Government Revenue Database (2016)
Taxes excluding social contributions	Percentage of GDP	Government Revenue Database (2016)
Taxes on income, profits and capital gains	Percentage of GDP	Government Revenue Database (2016)
Taxes on property	Percentage of GDP	Government Revenue Database (2016)
Taxes on goods and services	Percentage of GDP	Government Revenue Database (2016)
Taxes on international trade	Percentage of GDP	Government Revenue Database (2016)
Other taxes	Percentage of GDP	Government Revenue Database (2016)
Resource direct taxes incl. social contribution	Percentage of GDP	Government Revenue Database (2016)
Resource direct taxes, excl. social contr.	Percentage of GDP	Government Revenue Database (2016)
Resource indirect taxes	Percentage of GDP	Government Revenue Database (2016)
Non-resource direct taxes incl. social contribution	Percentage of GDP	Government Revenue Database (2016)
Non-resource direct taxes excl. social contribution	Percentage of GDP	Government Revenue Database (2016)
Non-resource indirect taxes	Percentage of GDP	Government Revenue Database (2016)
GDP per capita growth	Annual percentage difference	World Bank Group (2016)
Population Growth	Annual percentage growth rate	World Bank Group (2016)
Age 65 and above	Percentage of total population	World Bank Group (2016)
Export + Import/GDP adj. PPP	Percentage of GDP	World Bank Group (2016)
Agriculture/GDP	Percentage of GDP	World Bank Group (2016)
Gross capital formation	Percentage of GDP	World Bank Group (2016)
Unemployment	Percentage of total labour force	International Labour Organization (2016)
Inflation	Annual percentage difference	World Bank Group (2016)
International tourism, receipt	Percentage of total exports	World Bank Group (2016)
Urban population	Percentage of total population	World Bank Group (2016
Population density	People per sq. km of land area	World Bank Groups (2016)